Lloyd's Register

Rules and Regulations for the Classification of Ships, July 2008

Notice No. 10

Effective Date of Latest Amendments:

See page 1

Issue date: March 2009

Lloyd’s Register is an exempt charity under the UK Charities Act 1993

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the ‘Lloyd's Register Group’. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

RULES AND REGULATIONS FOR THE CLASSIFICATION OF SHIPS, *July 2008*

Notice No. 10

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Ships, July 2008.* The amendments are effective on the dates shown:

Part	***Chapter***	***Section***	***Effective date***
1	3	4, 5	1 July 2009
3	2	2	1 July 2009
3	9	5	1 July 2009
3	13	2, 7	1 July 2009
3	13	8	Corrigendum
4	1	8, 9	1 July 2009
4	2	1, 11	1 July 2009
4	4	1	1 July 2009
4	7	10	1 July 2009
8	1	2	1 July 2009
8	2	1, 2, 6, 9	1 July 2009

It will be noted that the amendments also include corrigenda, which are effective from the date of this Notice.

The *Rules and Regulations for the Classification of Ships, July 2008* are to be read in conjunction with this Notice No. 10. The status of the Rules is now:

Rules for Ships	Effective date:	July 2008
Notice No. 1	Effective dates:	1 August 2008 & Corrigenda
Notice No. 2	Effective dates:	1 January 2009 &Corrigenda
Notice No. 3	Effective dates:	1 November 2008 & Corrigenda
Notice No. 4	Effective dates:	1 May 2007 & 1 July 2008
Notice No. 5	Effective dates:	1 January 2009 & Corrigenda
Notice No. 6	Effective dates:	1 January 2009 & Corrigenda
Notice No. 7	Effective date:	1 January 2009
Notice No. 8	Effective date:	1 March 2009 & Corrigenda
Notice No. 9	Effective date:	1 July 2009
Notice No. 10	Effective dates:	1 July 2009 & Corrigendum

Part 1, Chapter 3
Periodic Survey Regulations

Effective date 1 July 2009

■ *Section 4*
Docking Surveys and In-water Surveys – Hull and machinery requirements

4.2 Docking Surveys

4.2.7 When chain cables are ranged, the anchors and cables are to be examined by the Surveyor, *see also* 5.3.13, 5.3.14, 5.3.16 and Table 3.5.1.

■ *Section 5*
Special Survey – General – Hull requirements

5.3 Examination and testing

5.3.16 On ships fitted with positional mooring equipment in accordance with Pt 7, Ch 8, or wire rope anchor cables in accordance with Pt 3, Ch 13,7, the anchors are to be cleaned and examined. Wire rope anchor cables are to be examined. If cables are found to contain broken, badly corroded or birdcaging wires they are to be renewed. Chain cables are to be ranged and examined. If any length of chain cable is found to be reduced in mean diameter at its most worn part by 12 per cent or more from its nominal diameter it is to be renewed. The windlass(es) or winches are to be examined.

Part 3, Chapter 2
Materials

Effective date 1 July 2009

■ *Section 2*
Fracture control

2.1 Grades of steel

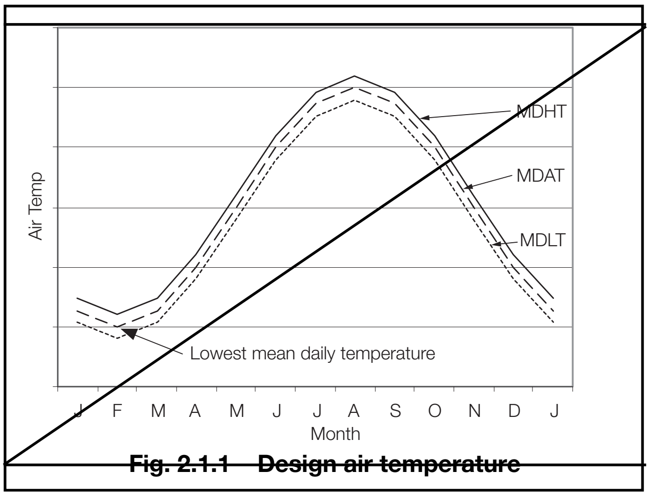
2.1.4 ~~The material grade of exposed structure of ships intended to operate in temperatures below minus 20°C will be specially considered. The design air temperature is to be taken as the lowest mean daily average air temperature in the area of operation:~~ Design for normal worldwide service assumes the navigation to areas of minus 10°C, where the design air temperature is to be taken as the lowest mean daily average air temperature in the area of operation:

where

Mean = statistical mean over a minimum of 20 years (MDHT)
Average = average during one day and one night (MDAT)
Lowest = lowest during the year (MDLT)

Fig. 2.1.1 shows the definition graphically.

The material grade of exposed structure of ships intended to operate in external air temperatures below minus 10°C will be specially considered, *see also The Provisional Rules for the Winterisation of Ships*.



~~**Fig. 2.1.1 Design air temperature**~~

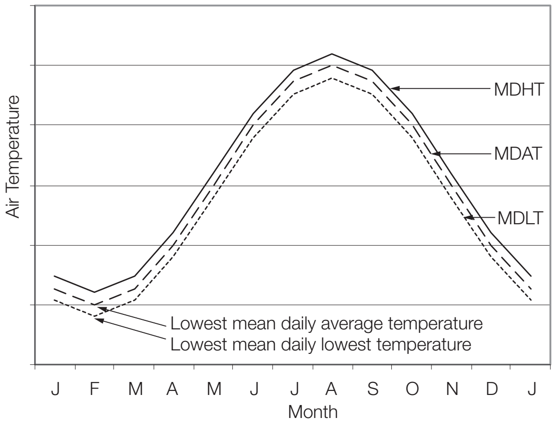


Fig. 2.1.1 Design air temperature

~~**Table 2.2.1 Material classes and grades**~~

Structural member category	Within 0,4*L* amidships	Outside 0,4*L* amidships
SECONDARY: • Lower strake in longitudinal bulkhead • Deck plating exposed to weather, in general • Side plating	I	A/AH
PRIMARY: • Bottom plating, including keel plate • Strength deck plating, excluding those belonging to the special category • Continuous longitudinal members above strength deck, excluding longitudinal hatch coamings • Upper strake in longitudinal bulkhead • Vertical strake (hatch side girder) and upper sloped strake in top wing tank	II	A/AH
SPECIAL: • Sheerstrake or rounded gunwale, *see* Note 1 • Stringer plate at strength deck, *see* Note 1 • Strength deck plating at outboard corners of cargo hatch openings in container carriers and other ships with similar hatch opening configurations, *see* Note 2 • Strength deck plating at corners of cargo hatch openings in bulk carriers (*see* 1.1.3), or carriers, combination carriers and other ships with similar hatch opening configuration, *see* Note 3 • Deck strake at longitudinal bulkhead, *see* Note 4 • Bilge strake, *see* Notes 5 and 6 • Longitudinal hatch coaming of length greater than 0,15*L*, *see* Note 7 • End brackets and deckhouse transition of longitudinal cargo hatch coamings, *see* Note 7	III	II, in general I, outside 0,6*L*

NOTES
1. In ships with length exceeding 250 m, sheerstrake or rounded gunwale and stringer plate at strength deck are not to be less than Grade E/EH within 0,4*L* amidships.
2. Plating at outboard corners of cargo hatch opening and plating intersections of the longitudinal underdeck girders and the cross-deck strips are not to be less than Class III within the length of the cargo region.
3. Not to be less than Class III within 0,6L amidships and Class II within the remaining length of the cargo region.
4. Excluding deck plating in way of inner-skin bulkhead of double hull ships.
5. In ships with a double bottom over the full breadth and with length less than 150 m, bilge strake may be of Class II within 0,4*L* amidships.
6. In ships with length exceeding 250 m, bilge strake is not to be less than Grade D/DH within 0,6*L* amidships.
7. Grade is not to be less than D/DH.
8. Corner inserts in way of any complex openings such as for lifts and side doors which may impinge on the deck plating or stringer plate are to be of Grade D/DH for $t \leq 20$ mm and Grade E/EH for $t > 20$ mm.
9. For strength members not mentioned, Grade A/AH may generally be used.
10. Within 0,4*L* amidships, single strakes required to be of Class III or of Grade E/EH are to have breadths not less than 800 + 5*L* mm, but need not be greater than 1800 mm.
11. The material class used for reinforcement and the quality of material (i.e. whether mild or higher tensile steel) used for welded attachments, such as waterway bars and bilge keels, is to be similar to that of the hull envelope plating in way. Where attachments are made to rounded gunwale plates, special consideration will be given to the required grade of steel, taking account of the intended structural arrangements and attachment details.
12. The material class for deck plating, sheerstrake and upper strake of longitudinal bulkhead within 0,4*L* amidships is also to be applied at structural breaks of the superstructure, irrespective of position.
13. Engine seat top plates outside 0,6*L* amidships may be Grade A/AH. Steel grade requirement for top plates within 0,6*L* amidships will be specially considered.
14. Steel grade is to correspond to the as-fitted thickness.
15. Plating materials for sternframes, rudders, rudder horns and shaft brackets are, in general, not to be of lower Grades than corresponding to Class II. For rudder and rudder body plates subjected to stress concentrations (e.g. in way of lower support of ~~semi-spade rudders or at upper part of spade rudders) Class III is to be applied.~~

Table 2.2.1 Material classes and grades *(see continuation)*

Structural member category	Material class/grade
SECONDARY	
A1. Longitudinal bulkhead strakes, other than belonging to the Primary category A2. Deck plating exposed to weather, other than that belonging to the Primary or Special category A3. Side plating	Class I within 0,4L amidships Grade A/AH outside 0,4L amidships
PRIMARY	
B1. Bottom plating, including keel plate B2. Strength deck plating, excluding that belonging to the Special category B3. Continuous longitudinal members above strength deck, excluding hatch coamings B4. Uppermost strake in longitudinal bulkhead B5. Vertical strake (hatch side girder) and uppermost sloped stake in top wing tank	Class II within 0,4L amidships Grade A/AH outside 0,4L amidships
SPECIAL	
C1. Sheer strake (or rounded gunwale) and stringer plate at strength deck, *see* Note 1 C2. Deck strake at longitudinal bulkhead excluding deck plating in way of inner skin bulkhead of double hull ships, *see* Note 1	Class III within 0,4L amidships Class II outside 0,4L amidships Class I outside 0,6L amidships
C3. Strength deck plating at outboard corners of cargo hatch openings (and plating intersections of the longitudinal underdeck girders and the cross-deck strips) in container carriers and other ships with similar hatch opening configurations	Class III within 0,4L amidships Class II outside 0,4L amidships Class I outside 0,6L amidships Minimum Class III within cargo region
C4. Strength deck plating at corners of cargo hatch openings in bulk carriers (*see* 1.1.3), ore carriers, combination carriers and other ships with similar hatch opening configurations	Class III within 0,6L amidships Class II within rest of cargo region
C5. Bilge strake in ships with double bottom over the full breadth and length less than 150 m, *see* Note 1	Class II within 0,6L amidships Class I outside 0,6L amidships
C6. Bilge strake in other ships , *see* Note 1	Class III within 0,4L amidships Class II outside 0,4L amidships Class I outside 0,6L amidships
C7. Longitudinal hatch coamings of length greater than 0,15L	Class III within 0,4L amidships Class II outside 0,4L amidships
C8. End brackets and deck house transition of longitudinal cargo hatch coamings	Class I outside 0,6L amidships Not to be less than Grade D/DH
SHIPS WITH LENGTH EXCEEDING 150 m AND SINGLE STRENGTH DECK	
D1. Longitudinal strength members of strength deck plating	Grade B/AH within 0,4L amidships
D2. Continuous longitudinal strength members above strength deck	Grade B/AH within 0,4L amidships
D3. Single side strakes for ships without inner continuous longitudinal bulkhead(s) between bottom and strength deck	Grade B/AH within cargo region
SHIPS WITH LENGTH EXCEEDING 250 m	
E1. Sheer strake (or rounded gunwale) and stringer plate at strength deck, *see* Note 2	Grade E/EH within 0,4L amidships
E2. Bilge strake, *see* Note 2	Grade D/DH within 0,4L amidships
SINGLE SKIN BULK CARRIERS SUBJECTED TO SOLAS REGULATION XII/6.5	
F1. Lower bracket of ordinary side frame, *see* Notes 6 and 7	Grade D/DH
F2. Side shell strakes included totally or partially between the two points located to 0,125l above and below the intersection of side shell and bilge hopper sloping plate or inner bottom plate, *see* Note 7	Grade D/DH

Table 2.2.1 Material classes and grades *(conclusion)*

NOTES

1. Single strakes required to be of Class III and within 0,4L amidships are to have breadths not less than $800 + 5L$ mm, but need not be greater than 1800 mm, unless limited by the geometry of the ship's design.
2. Single strakes required to be of Grade E/EH and within 0,4L amidships are to have breadths not less than $800 + 5L$ mm, but need not be greater than 1800 mm, unless limited by the geometry of the ship's design.
3. For strength members not mentioned, Grade A/AH may be generally used.
4. Steel grade is to correspond to the as-fitted thickness.
5. Plating materials for sternframes, rudders, rudder horns and shaft brackets are, in general, not to be of lower grades than corresponding to Class II. For rudder and rudder body plates subjected to stress concentrations (e.g. in way of lower support of semi-spade rudders or at upper part of spade rudders) Class III is to be applied.
6. The term 'lower bracket' means webs of lower brackets and webs of the lower part of side frames up to the point of 0,125l above the intersection of side shell and bilge hopper sloping plate or inner bottom plate.
7. The span of the side frame, l, is defined as the distance between the supporting structures.
8. Corner inserts in way of complex openings such as for lifts and side doors which may impinge on the deck plating or stringer plate are to be of Grade D/DH for $t \leq 20$ mm and Grade E/EH for $t > 20$ mm.
9. The material class used for reinforcement and the quality of material (i.e. whether mild or higher tensile steel) used for welded attachments, such as waterway bars and bilge keels, is to be similar to that of the hull envelope plating in way. Where attachments are made to rounded gunwale plates, special consideration will be given to the required grade of steel, taking account of the intended structural arrangements and attachment details.
10. The material class for deck plating, sheer strake and upper strake of longitudinal bulkhead within 0,4L amidships is also to be applied at structural breaks of the superstructure, irrespective of position.
11. Engine seat top plates outside 0,6L amidships may be Grade A/AH. Steel grade requirement for top plates within 0,6L amidships will be specially considered.

Part 3, Chapter 9

Special Features

Effective date 1 July 2009

■ *Section 5*
Helicopter landing areas

5.1 General

5.1.2 Attention is drawn to the requirements of National and other Authorities concerning the construction of helicopter landing platforms and the operation of helicopters as they affect the ship. These include SOLAS Chapter II-2 Regulation 18 and Chapter III Regulation 28 as applicable. Guidance on the provision and operation of helicopter landing or winching facilities may be drawn from international standards such as the *International Chamber of Shipping (ICS) Guide to Helicopter/Ship Operations and the International Aeronautical Search and Rescue Manual (IAMSAR)*.

5.3 Arrangements

5.3.1 The landing area is to be sufficiently large to allow for the landing and manoeuvring of the helicopter, and is to be approached by a clear landing and take-off sector complying in extent with the applicable Regulations, International Standards, or to the satisfaction of the National Authority.

5.3.2 The landing area is to be free of any projections above the level of the deck. Projections in the zone surrounding the landing area are to be kept below the heights permitted by the Regulations, International Standards, or to the satisfaction of the National Authority.

~~*5.3.4* Arrangements are to be made for drainage of the platform, including drainage of spilt fuel. These arrangements are to be constructed of steel and lead directly overboard, independent of any other system, and shall be designed so that drainage does not fall onto any other part of the ship.~~

~~*5.3.5* If the helideck is constructed from aluminium alloy, the following provisions apply:~~

~~(a) the deckhouse top and bulkheads under the platform shall have no openings;~~

~~(b) windows under the platform are to be provided with steel shutters.~~

~~*5.3.6*~~ *5.3.4* Engine uptake arrangements are to be sited such that exhaust gases cannot be drawn into helicopter engine intakes during helicopter take off or landing operations.

Part 3, Chapter 13

Ship Control Systems

Effective date 1 July 2009

■ *Section 2*
Rudders

2.7 Rudder couplings

2.7.7 Where a rudder stock is connected to a rudder by a keyless fitting, the rudder is to be a good fit on the rudder stock cone. During the fit-up, and before the push-up load is applied, an area of contact of at least ~~90~~ 80 per cent of the theoretical area of contact is to be achieved, and this is to be evenly distributed. The relationship of the rudder to stock at which this occurs is to be marked, and the push-up then measured from that point. The upper edge of the upper mainpiece bore is to have a slight radius. After final fitting of the stock to the rudder, positive means are to be used for locking the securing nut to the stock.

Table 13.2.10(b) Rudder couplings to stock – Conical couplings (*see continuation*) *(Part only shown)*

Item	Requirement
Required mean grip stress – keyless connection	$p_M = \dfrac{P_R\,\theta_t\,\delta_{CTM} + 4M_T\,10^3\sqrt{K_2\left(\left[\dfrac{P_R\,\delta_{CTM}}{2000M_T}\right]^2 + 1\right) - \left(\dfrac{\theta_t}{2}\right)^2}}{\cancel{5,66\delta}\;5,03\delta_{CTM}^2\,l_t\left(K_2 - \left(\dfrac{\theta_t}{2}\right)^2\right)}$
Corresponding push-up load	Approximately equal to $P_U = \cancel{2,83}\;0,8\,\pi\,p_M\,l_t\,\delta_{CTM}\left(K_3 + \dfrac{\theta_t}{2}\right)$

Table 13.2.11 Pintle requirements *(Part only shown)*

Item	Requirement
(1) Pintle diameter ~~(measured outside liner if fitted)~~	$\delta_{PL} = 0,35\sqrt{B\,k_o}$ mm

Symbols

b = distance in metres, from centroid of rudder area to the centre of lowest main bearing, *see* Fig. 13.2.4
c = distance, in metres, from centre of bearing of lower pintle to the centre of lowest main bearing, *see* Fig. 13.2.4
k_o = as defined in Table 13.2.3 or 13.2.4
B = bearing force, in N. If direct calculations are not carried out, the bearing force at various positions can be taken as:

$B_{1L} = \dfrac{b}{c}\,P_L$ for single pintle rudders and lower pintle of semi-spade rudders

$B_{1U} = \left(1 - \dfrac{b}{c}\right)P_L$ at upper pintle on semi-spade rudder. B_{1U} is not to be less than $0,35P_L$

$B = \dfrac{1}{N_{PL}}\,P_L$ for rudders with two or more pintles (except semi-spade rudders)

N_{PL} = number of pintles on the rudder
P_L = rudder force, as defined in 2.1.1

NOTE
The length of the pintle housing in the gudgeon is not to be less than the maximum pintle diameter.

Section 7
Equipment

7.1 General

Table 13.7.1 Equipment requirements (*see continuation*)

Ship type	Service	Required equipment
Cargo ships, bulk carriers, tankers, ferries, dredgers, etc. (*see* 1.1.2)	Unrestricted service	(1) *See* Tables 13.7.2 and 13.7.3, using N_C
Ferries	~~Certain restricted services~~ Specified coastal service, *see* Pt 1, Ch 2,2.3.9	(2) *See* Tables 13.7.2 and 13.7.3, using N_C and N_A as appropriate Mass of bower anchor Chain cable length and diameter } N_A = one grade below N_C Stream anchor may be omitted Anchor chains: Where L < 30 m, may be replaced with wire ropes of equal minimum breaking strength which should: (a) have a length 1,5 times that for chain cable required by Table 13.7.2 and (b) have a length of Grade U2/U1 chain cable not less than 12,5 m between anchor and wire rope. Where 30 m ≤ L ≤ 40 m one chain cable may be replaced with wire rope meeting the requirements of L > 40m. The other may be replaced with wire rope meeting the requirements of L < 30m. Where 40 m < L ≤ 90 m, both chain cables may be replaced with wire rope of equal minimum breaking strength which should (a) have a length 1,5 times that for chain cable required by Table 13.7.2 and (b) have a minimum mass per unit length of 30% that of Grade U2 chain cable required by Table 13.7.2 and (c) have a length of Grade U2/U1 chain cable not less than 12,5 m between anchor and wire rope.
Dredging and reclamation craft	Extended protected waters service, *see* Pt 1, Ch 2,2.3.7	(3) *See* Tables 13.7.2 and 13.7.3, using N_C and N_A as appropriate N_A = N_C reduced by two grades, except for stream anchors, or mooring lines Stream anchor – not required if ship fitted with positioning spuds
	Protected waters service, *see* Pt 1, Ch 2,2.3.6	(4) *See* Tables 13.7.2 and 13.7.3 using N_C and N_A as appropriate Mass of bower anchor Chain cable diameter } $N_A = 0{,}5N_C$ Bower anchors { powered ships – two anchors unpowered (manned) ships – one anchor Chain cable length – greater of 2L m or 10,0T_D m, but need not exceed requirements for an ordinary cargo ship with anchors of the same mass Mooring lines – as required for N_C Wire ropes – may be substituted for chain cable on bower anchors if breaking strength ≥1,5 times that of the chain cable. ~~To consist of six strands of a 'parallel lay' construction on independent wire rope core ('cross lay' strands over fibre core not acceptable).~~

Table 13.7.1 Equipment requirements (*conclusion*) (*Part only shown*))

Ship type	Service	Required equipment
Trawlers, stern trawlers, fishing vessels	Unrestricted service	(5) *See* Table 13.7.4, and Notes to Table 13.7.3 using N_C Anchor chains: Where L < 30 m, may be replaced with wire ropes of equal strength. Where 30 m ≤ L ≤ 40 m, one chain cable may be replaced with wire rope of equal strength provided normal chain cable maintained for the second line. Wire ropes of trawl winches complying with above may be used as anchor cables. Wire ropes substituted for anchor chains should (a) have a length 1,5 times that for chain cable required by Table 13.7.4 and (b) have a ~~short~~ length Grade U2/U1 of chain not less than 12,5 m between anchor and wire rope. Hawsers and warps – Sufficient in number and strength for proper working of the ship
For symbols, *see* continuation of Table		
Tugs	Unrestricted and restricted service	(6) *See* Table 13.7.2 using N_C except as stated below Stream anchor – not required Towlines – adequate for tug's maximum bollard pull with factor of safety ≥ 2,0
	Service restricted, *see* Pt 1, Ch 2,2.3.7 to 2.3.10	(7) *See* Table 13.7.2 using N_C Mass of bower anchor Chain cable diameter: reduced to correspond to two Equipment Letters below that required for N_C Anchor chains: As item (2) in this Table
	Protected waters service, *see* Pt 1, Ch 2,2.3.6	(8) *See* Table 13.7.2 using N_A Mass of bower anchor Chain cable diameter: $N_A = 0{,}5N_C$ Chain cable length = 0,5 times length required by N_A Where N_C < 90, the requirements for anchors and chain cable will be specially considered Anchor chains: As item (2) in this Table
Offshore supply ships	Unrestricted service	(9) *See* Tables 13.7.2 and 13.7.3, using N_C Chain cable length and diameter – increased to correspond to two Equipment Letters above that required for N_C. Need not be applied for ships with DP(AAA), DP(AA) or DP(AM) notations.

7.5 Towlines and mooring lines for ships under 90 m in length

~~*7.5.2* The lengths of individual mooring lines in Table 13.7.3 may be reduced by up to seven per cent of the Table length, provided that the total length of mooring lines is not less than would have resulted had all lines been of equal length.~~

7.6 Towlines and mooring lines for ships over 90 m in length

7.5.3 7.6.1 **Ships 90 m and over** in length do not require towlines and mooring lines as a classification item. It is recommended, however, that the number, length and strength of mooring lines provided on board the ship not be less than that given in Table 13.7.3~~ the sum of the strengths of all the mooring lines supplied to such ships should be not less than the Rule breaking load of one anchor cable as required by Table 13.7.2, based on Grade U2 chain for ships with equipment numbers up to 12400 and on Grade U3 chain for ships with higher equipment numbers. On ships regularly using exposed berths, twice the above total strength of mooring ropes is desirable. Where a separate towline is supplied, it is recommended that its strength be not less than 40 per cent of the strength of the anchor cable~~.

~~*7.5.4* It is recommended that not less than four mooring lines be carried on ships exceeding 90 m in length, and not less than six mooring lines on ships exceeding 180 m in length. The length of mooring lines should be not less than 200 m, or the length of the ship, whichever is the lesser.~~

~~*7.5.5*~~ *7.6.2* For ease of handling, fibre ropes ~~should~~ are to be not less than 20 mm in diameter. All ropes having breaking strengths in excess of 736,0 kN (75,0 tonne-f) and used in normal mooring operations are to be handled by, and stored on, suitably designed winches. Alternative methods of storing should give due consideration to the difficulties experienced in manually handling ropes having breaking strengths in excess of 490,0 kN (50,0 tonne-f).

~~*7.5.6*~~ *7.6.3* Mooring winches should be fitted with drum brakes, the strength of which is sufficient to prevent unreeling of the mooring line when the rope tension is equal to 80 per cent of the breaking strength of the rope as fitted on the first layer on the winch drum.

Existing sub-Section 7.6 *is to be renumbered* 7.7.

7.8 Winch design and testing

7.8.1 A winch of sufficient power and suitable for the size of wire rope and chain cable is to be fitted to the ship. Where owners require equipment significantly in excess of Rule requirements, it is their responsibility to specify increased winching power.

7.8.2 The requirements of 7.7.2 to 7.7.4 are to be applied as performance criteria for winches assuming an equivalent U2 Grade chain cable diameter and Rule length for the same equipment letter. When applying the requirements of 7.7.2(c) the factor K_b is to be taken as specified for when a chain stopper is not fitted.

Existing sub-Section 7.7 *are to be renumbered* 7.9.

~~7.8~~ 7.10 Structural requirements associated with anchoring

~~*7.8.1*~~ *7.10.1* The windlass or winch is to be efficiently bedded and secured to the deck. The thickness of the deck in way of the windlass or winch is to be increased, and adequate stiffening is to be provided, to the Surveyor’s satisfaction. The structural design integrity of the bedplate is the responsibility of the Shipbuilder and windlass or winch manufacturer.

~~*7.8.10*~~ *7.10.10* On dredging and reclamation craft the following are to be complied with:

(a) On unpowered ships, the windlass may be hand operated.
~~(b) When wire rope instead of chain is used for the anchor cable, it is to be stored on a properly designed drum or reel.~~
~~(c) Fairleads intended for use with wire rope cable are to be designed to minimize wear and to avoid kinking or other damage occurring to the rope. Fairleads should, in general, be fitted with rollers having a diameter not less than eleven times the diameter of the anchor cable, but a ratio of not less than 15,7 to 1 is recommended.~~
~~(d)~~ (b) On split type vessels, the arrangements are to be such that jamming of the anchor cable during opening and closing operations of the hull will not occur.

Existing sub-Sections 7.9 *and* 7.10 *are to be renumbered* 7.11 *and* 7.12.

Table 13.7.3 Equipment – Stream anchors, stream wires, towlines and mooring lines (*conclusion*) *(Part only shown)*

NOTES

5. ~~Irrespective of strength requirements, no fibre rope is to be less than 20 mm diameter.~~ The lengths of individual mooring lines may be reduced by up to seven per cent of the Table length, provided that the total length of mooring lines is not less than would have resulted had all lines been of equal length.
6. Tests. *See* Chapter 10 of the Rules for Materials for wire ropes and fibre ropes respectively.
7. For individual mooring lines with breaking strength above 490 kN the breaking strength may be reduced with corresponding increase of the number of the mooring lines and vice versa, provided that the total breaking strength of all lines aboard the ship is not less than the Rule value. In this case the number of lines is not to be less than 6 and no one line is to have a strength of less than 490 kN.
8. Where wire rope is used in lieu of chain cable for anchoring, *see* Table 13.7.1, galvanised wire rope with an independent wire core in accordance with Ch 10,6 of the Rules for Materials is to be used. Wire rope terminal fittings are to comply with an acceptable code or standard. The strength of terminations, connecting fittings, shackles or links is not to be less than that of the anchor line.

7.10.11 When wire rope instead of chain is used for the anchor cable, it is to be stored on a suitably designed drum or reel. Fairleads intended for use with wire rope cable are to be designed to minimize wear and to avoid kinking or other damage occurring to the rope. Fairleads should, in general, be fitted with rollers having a diameter not less than eleven times the diameter of the anchor cable or as specified/recommended by the rope manufacturer.

Table 13.7.8 Minimum design load for deck fittings and supporting structure *(Part only shown)*

NOTES
1. If a greater design load is specified by the designer, then this load is to be used. 2. The equipment number calculation is to include the maximum projected area of all deck cargo. 3. ~~The breaking strength of individual mooring lines may be reduced with a corresponding increase in the number of mooring lines provided that the total strength of all mooring lines is not to be less than that given in Table 13.7.3. In no case is the number of lines to be less than 6 or the breaking strength of each individual line less than 490kN.~~ Note 7 in Table 13.7.3 is applicable.

CORRIGENDUM

Section 8
Mooring of ships at single point moorings

8.2 Arrangements

Table 13.8.2 Fittings requirements for deadweight group *(Part only shown)*

Group	Chain size, in mm	No. of chain stoppers	SWL, in kN (tonnes)
I	76	1, *see* Note	1960 (200)
II	76	1, *see* Note	2450 (250)
III	76	2	3430 ~~(250)~~ (350)

Part 4, Chapter 1

General Cargo Ships

Effective date 1 July 2009

■ *Section 8*
Double bottom structure

8.4 Inner bottom plating and stiffening

8.4.4 Where the double bottom tanks are common with side tanks or cofferdams, the thickness of the inner bottom plating is to be not less than that required for deep tanks (*see* 9.2.1), with h, in metres, taken to the highest point of the side tank or cofferdam, and K_1 is to be taken as 'elsewhere'.

■ *Section 9*
Bulkheads

9.3 Shaft tunnels

Table 1.9.1 Watertight and deep tank bulkhead scantlings *(Part only shown)*

Item and requirement	Watertight bulkheads	Deep tank bulkheads
(1) Plating thickness for plane, symmetrically corrugated and double plate bulkheads	$t = 0{,}004sf\sqrt{h_4 k}$ mm but not less than 5,5 mm	$t = 0{,}004sf\sqrt{\frac{\rho h_4 k}{1{,}025}} + \cancel{2{,}5}\, K_1$ mm but not less than 6,5 mm, where $L < 90$ m nor less than 7,5 mm, where $L \geq 90$ m
Symbols		
h_4 = load head, in metres measured as follows: (a) For watertight bulkhead plating, the distance vertically from a point one-third of the height of the plate above its lower edge to a point 0,91 m above the bulkhead deck at side or perpendicular to the deepest equilibrium waterline in damaged condition obtained from applicable damage stability calculations, whichever is the greater, *see also* Fig. 3.5.2 in Pt 3, Ch 3 (b) For deep tank bulkhead plating, the distance from a point one-third of the height of the plate above its lower edge to the top of the tank, or half the distance to the top of the overflow, whichever is the greater, *see also* Fig. 3.5.2 in Pt 3, Ch 3 K_1 = 3,5 mm within 3 m below top of bulkhead = 2,5 mm elsewhere		

Part 4, Chapter 2

Ferries, Roll on-Roll off Ships and Passenger Ships

Effective date 1 July 2009

■ *Section 1*
General

1.3 Class notations

1.3.2 For passenger ships that comply with the requirements of the European Council Directive 98/18/EC of 17 March 1998 on safety rules and standards for passengers ships, and subsequent revisions, the following class notations may be appended to the main class notation:

(a) **EU(A)**. This class notation will be assigned to a passenger ship engaged on domestic voyages other than voyages covered by Classes B, C and D.

(b) **EU(B)**. This class notation will be assigned to a passenger ship engaged on domestic voyages in the course of which it is at no time more than 20 miles from the line of coast, where shipwrecked persons can land, corresponding to the medium tide height.

(c) **EU(C)**. This class notation will be assigned to a passenger ship engaged on domestic voyages in sea areas where the probability of exceeding 2,5 m significant wave height is smaller than 10 per cent over a one-year period for allyear-round operation, or over a specific restricted period of the year for operation exclusively in such period (e.g. summer period operation), in the course of which it is at no time more than 15 miles from a place of refuge, nor more than 5 miles from the line of coast, where shipwrecked persons can land, corresponding to the medium tide height.

(d) **EU(D)**. This class notation will be assigned to a passenger ship engaged on domestic voyages in sea areas where the probability of exceeding 1,5 m significant wave height is smaller than 10 per cent over a one-year period for allyear- round operation, or over a specific restricted period of the year for operation exclusively in such period (e.g. summer period operation), in the course of which it is at no time more than 6 miles from a place of refuge, nor more than 3 miles from the line of coast, where shipwrecked persons can land, corresponding to the medium tide height.

Existing paragraphs 1.3.2 to 1.3.6 are to be renumbered 1.3.3 to 1.3.7.

■ *Section 11*
Miscellaneous openings

11.4 Frame design and testing

11.4.1 **Application**. The testing requirements contained in this Section are for all exterior window designs on all tiers for passenger ships regardless of length. The testing is to be carried out for characteristic window sizes (largest, smallest) and forms (circular, semi-circular and rectangular) for each passenger ship. Window designs, which are not covered by Type Approval Certification, will require prototype testing in order to confirm structural integrity and weather or water tightness as required. Tests are to be carried out to the satisfaction of the Surveyor.

Part 4, Chapter 4

Offshore ~~Supply Ships~~ Support Vessels

Effective date 1 July 2009

■ *Section 1* General

1.1 Application

Table 4.1.1 Class notations applicable to offshore support vessels

Class notation	Requirements
100A1	Pt 1, Ch 2
Offshore supply ship	Pt 4, Ch 4, Sections 1 to 7
Supply ship	Pt 4, Ch 1
Standby ship	Pt 4, Ch 4, Sections 1 to 7 and 9
Anchor handler	Pt 4, Ch 4, Sections 1 to 7 and 10 Sections 5 to 7 need not be applied if notation for **Offshore supply ship** is not applied
Tug **Escort tug** **Escort tug EPN (F,B,V,C);**	Pt 4, Ch 3, Sections 1 to 8 Pt 4, Ch 3, except 9.3 Pt 4, Ch 3
AHTS	Pt 4, Ch 3, Sections 1 to 8; and Pt 4, Ch 4, Sections 1 to 7 and 10
Oil Recovery	Pt 7, Ch 5

NOTES
1. A ship designed to fulfil more than one function can be assigned a combination of the notations listed above, e.g.:
    - **100A1 Offshore supply ship/Standby ship**
    - **100A1 Offshore supply ship/Anchor handler**
    - **100A1 Offshore supply ship/Standby ship/Oil Recovery**
    - Any combination of the requirements listed in this table.
2. The notation **Offshore Supply Ship** will be assigned to ships that are designed to be operated on unrestricted worldwide service.
3. The notation **Supply Ship** will be assigned to ships that are designed for operation in specified restricted locations where the environmental conditions are less severe than for unrestricted worldwide service.

Part 4, Chapter 7

Bulk Carriers

Effective date 1 July 2009

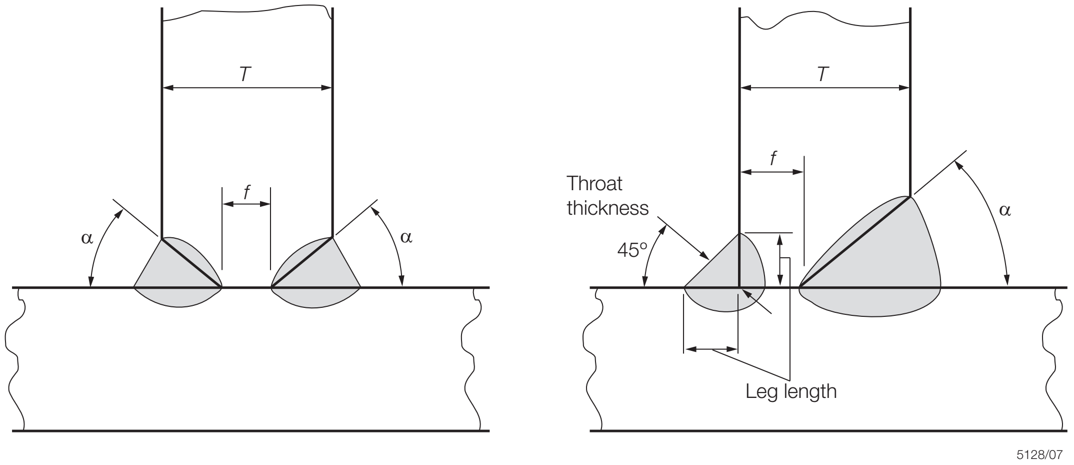
■ *Section 10* Bulkheads

10.6 Vertically corrugated transverse bulkheads – support structure at ends

(Part only shown)

10.6.2 **Lower stool**:

(j) Where corrugations are terminated on the bottom stool, corrugations are to be connected to the stool top plate by full penetration welds. The stool side plating is to be connected to the stool top plate and the inner bottom plating by either full penetration or ~~deep~~ partial penetration welds, *see* Fig. 7.10.7. The supporting floors are to be connected to the inner bottom by either full penetration or ~~deep~~ partial penetration welds.



Root face f = 3 mm to $T/3$ mm

Groove angle α = 40 to 60

Throat thickness =
Leg length = } *See* Pt 3, Ch 10 of the Rules for Ships

Fig. 7.10.7 **~~Welding~~ Partial penetration welding**

Part 8, Chapter 1

Application

Effective date 1 July 2009

■ *Section 2*
Ice environment

2.5 National Authority requirements

2.5.6 For ships intending to navigate in Finnish-Swedish waters and having a Polar Ice Class notation, consideration may need to be given to the installed engine power such that it complies with the applicable *Finnish-Swedish Ice Class Rules*, *see* Ch 2, 7.

Part 8, Chapter 2

Ice Operation - Ice Class

Effective date 1 July 2009

■ *Section 1*

Strengthening requirements for navigation in ice – Application of requirements

1.1 Additional strengthening

1.1.3 Where the hull and machinery are constructed so as to comply with the requirements of different ice classes, then the assigned Ice Class Notation will be indicated for the combination as the lower of these classes on the Certificate of Class. Any compliance of the hull or machinery with the requirements of a higher ice class will be indicated in square brackets after the main notation. Other supplementary information that would influence the ice performance will also be indicated. For example, a ship hull built in compliance with 1B FS and the machinery in compliance with 1AS FS would be assigned the Notation **Ice Class 1B FS [1AS FS Machinery]** or **Ice Class 1B FS [1AS FS azimuth thrusters]** where azimuth thrusters are included in the approval.

1.1.4 The vertical extent of the ice strengthening is related to the ice light and ice load waterlines, which are defined in 2.2. The maximum and minimum draughts at both the fore and aft ends (for the lowest ice class) will be stated on the Certificate of Class.

1.1.5 The installed and required minimum engine output (for the lowest ice class), *see* Section 7, will be stated on the Certificate of Class.

1.4 Application for multi-year ice conditions

1.4.2 Ships that comply with Sections 10 and 11 can be considered for a Polar Class (PC) notation as listed in Table 2.1.1. ~~The requirements of Sections 10 and 11 are in addition to the open water requirements. If the hull and machinery are constructed such as to comply with the requirements of different polar classes, then both the hull and machinery are to be assigned the lower of these classes in the classification certificate. Compliance of the hull or machinery with the requirements of a higher polar class is also to be indicated in the classification certificate or an appendix thereto.~~

■ *Section 2*

General hull requirements for navigation in ice – All ice classes

2.1 General

2.1.9 ~~The vertical extent of the ice strengthening is related to the ice light and ice load waterlines, which are defined in 2.2. The maximum and minimum Ice Class draughts at both the fore and aft ends will be stated on the Class Certificate. In addition, the installed and required minimum engine output, see Section 7, will be stated on the Class Certificate.~~ Shell strakes in way of ice strengthening area for plates are to be grade B/AH.

■ *Section 6*

Hull requirements for first-year ice conditions – Ice classes 1AS FS, 1A FS, 1B FS ~~and 1C FS~~, 1C FS and 1D

6.1 Framing – General requirements

6.1.3 Asymmertircal frames and frames which are not at right angles to the shell (web less than 90 degrees to the shell) shall be supported against tripping by brackets, intercostals, stringers or similar, at a distance not exceeding 1300 mm. For **Ice Class 1D**, the distance may be increased to 2000 mm. For frames with spans greater than 4 m the extent of anti-tripping supports is to be applied to all regions. For frames with spans less than or equal to 4 m the extent is to be as given in Table 2.6.1. FEA may be carried out to demonstrate equivalent support of alternative arrangements.

Table 2.6.1 Extent of anti-tripping supports

Ice Class	Extent of anti-tripping supports
1AS FS	All regions
1A FS	Forward and midship regions
1B FS	Forward region
1C FS	Forward region
1D	Forward region

Table ~~2.6.1~~ 2.6.2 Longitudinal distribution factor α_o

Table ~~2.6.2~~ 2.6.3 Minimum speed

■ *Section 9*
Machinery requirements for first-year ice conditions – Ice classes 1AS FS(+), 1A FS(+), 1B FS(+) and 1C FS(+)

9.1 Powering of ice strengthened ships

9.1.3 The shaft power necessary to provide an ice-breaking capability can be determined by the equation:

$$P_1 = 0{,}736C_1\,C_2\,C_3\left[240Bh\,(1 + h + 0{,}035v^2) + 70S_c\sqrt{L}\right]\ \text{kW}$$

where

B = moulded breath of ship, in metres, *see* Pt 3, Ch 1,6.1.3
L = Rule length, in metres, *see* Pt 3, Ch 1,6.1.1
Δ = displacement, in tonnes, *see* Pt 3, Ch 9,7.2.1
$C_1 = \dfrac{1{,}2B}{\sqrt[3]{\Delta}}$ but is not to be taken as less than 1,0
C_2 = 0,9 if the ship is fitted with a controllable pitch propeller, otherwise 1,0
C_3 = 0,9 if the rake of the stem is 45° or less, otherwise 1,0. The product $C_2\,C_3$ is not to be taken as less than 0,85
C_4 = 1,1 if the ship is fitted with a bulbous bow, otherwise 1,0
h = ice thickness
= 1,0 for **Ice Class 1AS FS(+)**
= 0,8 for **Ice Class 1A FS(+)**
= 0,6 for **Ice Class 1B FS(+)**
= 0,4 for **Ice Class 1C FS(+)**
S_c = depth of snow cover
v = ship speed, in knots, when breaking ice of thickness h.

Cross-References

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Ships.

Part 3, Chapter 5

3.5.5	*Reference* Pt 3, Ch 13,7.8 *now reads* Pt 3, Ch 13,7.10.

Part 3, Chapter 11

6.1.13	*Reference* Pt 3, Ch 13,7.8.5 *now reads* Pt 3, Ch 13,7.10.5. *Reference* Pt 3, Ch 13,7.8.7 *now reads* Pt 3, Ch 13,7.10.7.
6.6.22	*Reference* Pt 3, Ch 13,7.8.5 *now reads* Pt 3, Ch 13,7.10.5. *Reference* Pt 3, Ch 13,7.8.7 *now reads* Pt 3, Ch 13,7.10.7.

Part 3, Chapter 13

7.6.2(b)(i) ***(7.8.2)(b)(i)***	*Reference* 7.6.2(a) *now reads* 7.8.2(a).
7.6.3 ***(7.8.3)***	*Reference* 7.6.2 *now reads* 7.8.2.
7.6.5 ***(7.8.5)***	*Reference* 7.6.2 *now reads* 7.8.2.
7.9.8 ***(7.11.8)***	*Reference* Pt 3, Ch 13,7.9.4 *now reads* Pt 3, Ch 13,7.11.4.
7.9.9 ***(7.11.9)***	*Reference* Pt 3, Ch 13,7.9.4 *now reads* Pt 3, Ch 13,7.11.4. *Reference* Pt 3, Ch 13,7.9.5 *now reads* Pt 3, Ch 13,7.11.5.
7.10.11 ***(7.12.11)***	*Reference* 7.10.12 *now reads* 7.12.12 (*Two instances*). *Reference* 7.10.13 *now reads* 7.12.13 (*Two instances*). *Reference* 7.10.14 *now reads* 7.12.14 (*Two instances*).

Part 4, Chapter 9

9.1.1	*Reference* 1.3 *now reads* 1.4.

Part 6, Chapter 2

8.5.1(d)	*Reference* Pt 3, Ch 13,7.6 *now reads* Pt 3, Ch 13,7.8.

Part 8, Chapter 2

6.3.2	*Reference* Table 2.6.1 *now reads* Table 2.6.2.
6.5.1	*Reference* Table 2.6.2 *now reads* Table 2.6.3 *(Two instances)*.
6.5.4	*Reference* Table 2.6.2 *now reads* Table 2.6.3.

© Lloyd’s Register, 2009
Published by Lloyd’s Register
Registered office
71 Fenchurch Street, London, EC3M 4BS
United Kingdom